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Poverty, Population Density, and the Epidemiology of Burns in Young Children from Mexico Treated at a U.S. Pediatric Burn Facility

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Abstract

Introduction: Children 5 and younger are at risk for sustaining serious burn injuries. The causes of burns vary depending on demographic, cultural and socioeconomic variables. At this pediatric burn center we provided medical care to children from Mexico with severe injuries. The purpose of this study was to understand the impact of demographic distribution and modifiable risk factors of burns in young children to help guide prevention.

Methods: A retrospective chart review was performed with children 5 and younger from Mexico who were injured from 2000–2013. The medical records of 447 acute patients were reviewed. Frequency counts and percentages were used to identify geographic distribution and calculate incidence of burns. Microsoft Powermap software was used to create a geographical map of Mexico based on types of burns. A binomial logistic regression was used to model the incidence of flame burns as opposed to scald burns in each state with relation to population density and poverty percentage. In all statistical tests, alpha = .05 for a 95 % level of confidence.

Results: Burns were primarily caused by flame and scald injuries. Admissions from flame injuries were mainly from explosions of propane tanks and gas lines and house fires. Flame injuries were predominantly from the states of Jalisco, Chihuahua, and Distrito Federal. Scalds

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were attributed to falling in large containers of hot water or food on the ground, and spills of hot liquids. Scald injuries were largely from the states of Oaxaca, Distrito Federal, and Hidalgo. The odds of a patient having flame burns were significantly associated with poverty percentage (p<.0001) and population density (p=.0085). Increasing levels of poverty led to decrease in odds of a flame burn, but an increase in the odds of scald burns. Similarly, we found that increasing population density led to a decrease in the odds of a flame burn, but an increase in the odds of a scald burn.

Conclusions: Burns in young children from Mexico who received medical care at this pediatric burn center were attributed to flame and scalds. Potential demographic associations have been identified. Different states in Mexico have diverse cultural and socioeconomic variables that may influence the etiology of burns in young children and this information may help efficiently tailor burn prevention campaigns for burn prevention efforts in each region.

Applicability of Research to Practice: This information will be used to develop and help modify existing prevention campaigns.

1. Introduction

Childhood burns can cause severe physical and psychological complications [1]. Burn injuries continue to pose a serious threat to young children in both developing and developed countries [2,3]. In the United States, the Centers for Disease Control and Prevention (CDC) reports that five percent of unintentional injury deaths of children between the ages of 0–19 were attributed to burns. The CDC reported that children in the 1–4 years old age group had higher rates of death due to flame injuries than other age groups [4]. Children in developing countries tend to have more severe burns and more adverse complications from their burn injuries than children in the developed world [5].

Several studies have examined risk factors associated with burns in young children in developing countries. Studies from Peru and Brazil have identified many diverse socioeconomic variables that may lead to childhood burn injuries [6–7]. In a study conducted in Peru, researchers found that socioeconomic factors such as lack of water supply, low familial income, and crowding were factors that put young children at a higher risk for burn injuries [7]. Similarly, a study conducted in Rio de Janeiro found that the risk for childhood burns was higher in children who lived in crowded households, were not the first born child, had a pregnant mother, had recently moved to a new residence, or who had a mother recently dismissed from a job [6].

Our pediatric burn hospital treats many children with life threatening injuries from Mexico. In an effort to elucidate modifiable risk factors in our patient population from Mexico, we published a retrospective chart review on the epidemiology of burns. For our first paper, 447 patients at our pediatric burn facility met the criteria for the study. The most common causes of burn injuries were flame burns and scald burns. Flame burns were caused primarily by explosions of fuel and house fires. Scald injuries were attributed to children falling into containers of hot liquids and from spillage of hot liquids. The mean total body surface area (TBSA) burned for flame injuries was 45.5 + 19.0% and the mean TBSA for scald injuries was 44.5 + 15.4%. The mean age for sustaining flame burns was 3.0 + 1.5 and for scald burns was 2.6 + 1.2 years of age. More information on the causes of burn injuries and other epidemiological characteristics of our patient population can be found in our original paper [8].

Further research on the risk factors of childhood burn injuries is needed for many Latin American countries [6–7]. To our knowledge, very little literature exists on how socioeconomic factors and geographic location play a role in childhood burn injuries for children in Mexico. As a result, we decided to reexamine the data from our previous paper and strived to identify how factors, such as poverty and population density, were correlated with burn injuries in our young patients from Mexico [8].

2. Methods

2.1. Design

This paper builds on the work done in our previous epidemiology of burns manuscript [8]. The present study analyzes the data in that article with a focus on the impact of poverty and population density on scald and flame burns in young children from Mexico treated at this pediatric burn hospital. Documentation in the medical record for the socioeconomic situation of each patient was inconsistently available. As a result, we used measures of poverty and population density by each Mexican state, as a proxy for the socioeconomic situations of patients from that state. Poverty levels for each state were collected from the CONEVAL organization in Mexico (National Council for the Evaluation of Social Development Policy). The CONEVAL organization is run by Mexico’s Ministry of Social Development. [9]. Population density data for each state was collected from the National Institute of Statistics and Geography in Mexico (INEGI) [10].

2.2. Definitions

Poverty was measured by the CONEVAL organization. The CONEVAL organization calculated the percentage of people living in poverty in each state based on the following factors: per capital income, education attainment, access to healthcare, access to Mexican social security services, quality of living spaces, access to food, food insecurity, social cohesion measurements, and access to infrastructure like paved roads. The authors of this study do not know the exact method CONEVAL used to calculate the percentage of a state’s population that was living in poverty, nor do we know how much weight the factors listed above were given when poverty levels were calculated. We believe the data provided by the CONEVAL organization is the best method for calculating poverty levels for the geographic area we are studying given that the CONEVAL organization is a national organization that was created by the federal government and endorsed by the President of Mexico [9, 11–13]. Population density was calculated by the INEGI. Population density was defined as people over kilometer^2 (km^2) [10].

2.3. Participants

For the original study, the hospital census was examined to identify all young children from Mexico who sustained acute burn injuries from 2000 to 2013. In that study, the medical records of 447 children were reviewed to identify the demographic characteristics of each patient as well as the cause of burn. Children who were injured in Mexico, treated at this pediatric burn hospital, and who were 5 years old or younger at the time of injury were included in the study. Children who were older and/or had other medical conditions were excluded from the study [8].

2.4. Analyses

Frequency counts and percentages were used to identify geographic distribution. Microsoft Powermap software was used to create a geographical map of Mexico based on types of burns. A binomial logistic regression was used to model the incidence of flame burns as opposed to scald burns in each state with relation to population density and poverty percentage. Population density was log (base 2) transformed to reduce skewness. All modeling was performed using R statistical software (R Core Team, 2016, version 3.3.0). In all statistical tests, alpha = 0.05 for a 95 % level of confidence [14]. In order to calculate a yearly incidence rate, total patients from each state were divided by 14 years.

3 Results:

The top five Mexican states that sent the most patients to our pediatric burn facility for all types of burn injuries were Jalisco (n = 47), Distrito Federal (n = 43), Chihuahua (n = 31), Oaxaca (n = 30), and Veracruz (n = 27) [8]. Table 1 contains information on the total number of patients sent to this pediatric burn hospital as well as the distribution of flame and scald burn by state. Map 1 shows the distribution of patients sent to this hospital from each state in Mexico. Map 2 shows the geographic distribution of flame and scald burns by each state in Mexico. States in northern Mexico, like Chihuahua, Tamaulipas, Jalisco, Guanajuato, tended to have more flame burns than scald burns, while states in southern Mexico, like Oaxaca, Chiapas, Campeche, Quintana Roo tended to have more scald burns than flame burns [8].

On average, 45.5% of the Mexican population was defined as living in poverty by the CONEVAL organization [9]. The three states with the most poverty were Chiapas (74.7%), Guerrero (69.7%), and Puebla (64.5%). The states with the lowest levels of poverty were Distrito Federal (28.9%), Coahuila (27.9%), and Nuevo León (23.2%) [9]. Additional information on the poverty levels of each state of Mexico can be found on Map 3. The average population density in Mexico is 57 people/km2. The states with the highest population density are Distrito Federal (5920 people/km2), Estado de México (679 people/km2), and Morelos (364 people/km2). The states with the smallest population density were Baja California Sur (7 people/km2), Durango (12 people/km2), Sonora (13 people/km2) [10]. Map 4 contains information on the population density by state in Mexico [10]. Table 1 contains the population density and poverty levels for each state in Mexico [9–10].

Per the logistic regression model, the odds of a patient having flame burns were significantly associated with poverty percentage ($p<0.0001$) and population density ($p=0.0085$), as illustrated in Figures 1 & 2. Figure 1 shows incidence of flame as opposed to scald burns with relation to poverty, where each 1% increase in poverty was associated with a 5% decrease in the odds of flame burns (equivalently, a 5% increase in the odds of scald burns). Figure 2 shows incidence of flame as opposed to scald burns with relation to population density, where each doubling of population density was associated with a 11% reduction in the odds of flame burns (equivalently, a 12% increase in the odds of scald burns). Table 2 contains information on the logistic regression results.

4 Discussion:

Literature has shown a direct and clear correlation between sustaining a burn and environmental circumstances, including poverty, crowding, and poor maternal education [6–7][15][16]. The results of this study are striking in that regional poverty levels and population density were shown to be significantly associated with type of burn injury. We found that increasing levels of poverty led to a decrease in odds of a flame burn, but an increase in the odds of scald burns. Similarly, we found that increasing population density led to a decrease in the odds of a flame burn, but an increase in the odds of a scald burn.

Overall 45.5% of the of Mexico’s population is said to be living in poverty. It is important to stress that burns and poverty are syndromes with a multifactorial etiology. To help quantify what poverty means in a socioeconomically diverse country like Mexico, we mention indicators that define and grade poverty including: per capita income, educational lagging in the household, healthcare access, social security access, quality and characteristics of the living space, access to the basic services of the living space, access to feeding, degree of food insecurity, social cohesion degree, and accessibility degree to pavement roads [9]. The results of the present study showed that states with the most flame injuries which included Chihuahua, Distrito Federal, Guanajuato, Jalisco, and Tamaulipas tended to have less people living in poverty than Mexico’s overall poverty level [9]. With the exception of Distrito Federal, those states had more flame injuries than scald injuries. Another exception was the state of Veracruz which had the same number of flame injuries as the state of Tamaulipas and which had more flame injuries than scald injuries [8]. The poverty level in Veracruz (52.6%) is slightly higher than the countries’ overall poverty level [9]. We speculate that these regions may be financially better off, may have greater access to basic household services such as gas propane tanks, gas stoves, gasoline, matches and lighters which could be the source of their higher number of flame injuries.

Similarly, states that had the most scald burns which included Oaxaca, Hidalgo, and Chiapas tended to have poverty levels of 61.9%, 52.8%, and 74.7% respectively [9]. These states had more scald injuries than flame injuries within their respective borders. The only exception to this rule was Distrito Federal which had a comparable number of scald burns as these other states and which had more slightly more scald injuries than flame injuries, but a poverty percentage of 28.9% [8–9]. A possible explanation for this data is that these communities with increased poverty may have had limited infrastructure. In fact, many houses in this region are limited to one or two rooms which serve as an area for sleeping, cooking, and bathing. Some living environments do not have running water and electricity. In these humble homes, it is very common to cook outside at the floor level on fire wood in low standing grills and chimneys because the lack of gas stoves. This places young children at risk for scald burns because containers of hot food and water for bathing were often placed on the ground to cool. In Nepal, Elsey and colleagues (2016) found that although caregivers understood the risk of smoke and burns from “chulas”, a type of wooden ground community stove used to prepare meals, they could not switch to safer gas alternatives because of limited financial means [17]. The absence of delimited cooking and bathing spaces and divisions inside the house contributes to the risk of scald burns. This can create a dangerous place for young children who are playing and running because they can suffer scald burns by falling inside the boiling pots that are being heated on the floor or by reaching for containers with hot liquids that are sitting on furniture. For example, in Peru, researchers found that 21.3% of scald injuries in young children occurred when a child tried to get a cup on a table and 16.8% of scald injuries occurred when children came into contact pots of hot liquid on floors [7].

A large percentage of Mexico's population is concentrated in the southern states and around Mexico City (Distrito Federal). For example, Mexico City has a 5920 people/km^2 [10]. Estado de México, Morelos, and Tlaxcala which directly border Mexico City have a population density of 670 people/km^2, 364 people/km^2, and 293 people/km^2 respectively [10]. We had more patients with scald burns than flame burns in each of those states. For example, in Distrito Federal, we had 22 scald burns and 21 flame burns. In Estado de México, we had 15 scald burns and 4 flame burns. In Tlaxcala, we had 3 scald burns and 1 flame burn [8]. In contrast to these central Mexican states, states in the northern region tend to be sparsely populated. Northern states such has Coahuila, Chihuahua, and Durango have population densities of 18 people/km^2, 13.2 people/km^2, and 12 people/km^2 respectively [10]. When we examined the types of burns treated at our pediatric burn hospital from these states, we identified that there were more flame than scald burns from these regions. For example, Chihuahua had 23 flame burns and 8 scald burns; and Durango had 4 flame burns and 2 scald burns [8]. Coahuila was an exception because it had an equal number of scald and flame burns. A similar pattern is seen in the United States in less populated areas. The United States Centers for Disease Control and Prevention (CDC) found that Southern states such as Louisiana, Arkansas, Alabama, Tennessee, South Carolina, Oklahoma, Kansas, and Kentucky have some of the highest rates of childhood mortality in the country due to flame burns [4]. In these states outdoor activities such as cook-outs, camping, bonfires, and fireworks tend to be common because these states are less densely populated and therefore may place young children at risk for flame burns [18]. Although correlation between population density and the odds of a particular type of injury does not always imply causation, the authors can provide possible explanations for this data. In areas with higher population density, there may not be a lot of open fires from burning trash, campfires, or fireworks. Thus, these states may not have many flame injuries. In contrast, states with lower population densities have enough open space for open fires. With regards to scalds, Delgado and colleagues (2002) hypothesized that scalds may be associated with crowding because houses in areas with higher population densities may not have a separate room for a kitchen. As a result, there may not be a physical barrier separating containers with hot liquids from areas where children live. In Peru, Delgado and colleagues (2002) found that areas with higher population densities tend to have more shantytowns which did not have running water. Residents in these shantytowns had to boil water for cooking and bathing which put children at higher risk for scald burns. In Mexico, further investigations into why population density is associated with an increase in scald burns but a decrease in flame burns is needed [7].

Before discussion on strategies that prevent childhood burns in Mexico can begin, the sociodemographic variables that are correlated with burn injuries must be understood. Alnababtah and colleagues (2014) found that low household income, living in deprived areas, living in rented accommodation, young mothers, single-parent families, and children from ethnic families were factors associated with increased incidence of childhood burn injuries [16]. Similarly, Dissanaike and colleagues (2017) found an inverse relationship between the level of education of an individual and the risk of burns, with lower levels of education producing greater risks [15]. Additionally, they found evidence that areas with high poverty rates were associated with an increased rate of burns [15]. This is similar to the findings of our current study because we looked at the aggregate poverty levels of the states in Mexico instead of the individual's socioeconomic status. Delgado and colleagues (2002) found that absence of water supply in a household, salary less than 28.5 dollars/month per capita, and crowding were all significant risk factors for childhood burns in Peru. With regards to family structure, children in that study who were supervised by non-familial heads of the household were at increased risk for burns. They also found that education above high school level in either parent was a protective factor which decreased the risk of childhood burns [7]. The literature is largely silent on the topic of childhood burns in Mexico. However, Moctezuma-Paz and colleagues (2015) found that poverty, a culture that does not emphasize burn prevention, and a legal system that does not regulate fire prevention are risk factors for sustaining burn injuries in Mexico. With regards to burns in adults and children, these authors found that most burn injuries in Mexico occurred in the states of Jalisco, Distrito Federal, and Estado de México. When looking at the data for children in Mexico, they found that 90 percent of burn injuries occurred at home and 80 percent of all burn injuries in children were scalds [19]. Lack of adequate supervision for young children at the time of burn injury is an issue in our patient population. In our previous study [8], we examined if an adult was present at the time of burn injury. In the majority of flame burns and scald burns, an adult was present in the house when the injury occurred. Interestingly, we found that when children were engaging in risky behavior such as playing with matches, fireworks, and lighters, the vast majority of these children were not being supervised by an adult.

The general lack of a coordinated national response to the burden of childhood unintentional or even intentional burn injuries is of concern. The global community must create stronger coalitions and national or local plans for action. There have been many examples of successful public health prevention campaigns that can serve as frameworks to help decrease the severity of burn injuries in Mexico's children. The World Health Organization (WHO) [20] and the United Nation's Children Fund (UNICEF) [21] are two organizations with considerable experience in eradicating the burdens of disease around the world. They not only have the expertise on how to solve complex public health problems but also have experience in coordinating prevention campaigns with a multitude of governmental organizations and charitable institutions. For example, WHO's campaign to eradicate polio in many impoverished countries has tremendously reduced the incidence of polio. Similar campaigns against smallpox, yaws, and malaria are other inspirational examples of the WHO's and UNICEF's fight against public health threats [20, 21]. In the United States, celebrities have helped raise awareness and money for many medical issues. For example, Michael J Fox, an actor in the United States created the Michael J Fox Foundation for Parkinson's disorder and this foundation has funded 700 million dollars for finding a cure for Parkinson's [22]. Similarly, Christopher Reeve, an actor popularly known for his role playing Superman, started a foundation that has raised a tremendous amount of money for those suffering from paralysis [23]. Another institution in Mexico with considerable resources is the Roman Catholic Church which serves many impoverished areas. If religious organizations with considerable clout, international public health organizations, and celebrities were to team up to decrease the incidence of childhood burn injuries, considerable suffering and disability could be averted.

Mexico and many other countries around the world do not have comprehensive burn registries that can track burn injuries. As a result, death rates from burn injuries in low and middle income countries may have been underestimated due to lack of epidemiological data. There is a strong need for longitudinal studies to accurately measure the impact of injuries in low and middle income countries (LMIC) [24]. Mexico and other LMICs tend to lack comprehensive data on the incidence, causes, and longitudinal impact of fire injuries [24]. The Geneva Association's World Fire Statistics Centre publishes data generated by national governments on the impact of fires however, it is usually developed countries where information is collected [25]. Twigg and colleagues (2017) advocate for adapting community-based risk and vulnerability assessments, which are typically used in disaster risk reduction to urban fire assessments. They also advocate for empowering local citizens in collecting and sharing geospatial information via existing technology to create better fire incidence surveillance data. These researchers have suggested the adoption of the Haddon Matrix, which was originally developed for public health surveillance of road accidents, for burn injuries. [26].

As we observed in our Mexican maps, burns are a national epidemic. Non-governmental organizations have put considerable effort in launching burn prevention campaigns. However, the coverage has not reached all demographic areas because many campaigns are restricted with finite financial and labor resources. We propose to launch a burn prevention campaign with nationwide coverage that is tailored to each region's socio-demographic characteristics. For example, burn prevention in Mexico's northern states could be initially tailored to flame injuries while burn prevention in Mexico's southern states could be initially tailored to prevent scald injuries. The campaigns in each state should be tailored to different levels of education and ages, because we know that illiteracy is more highly prevalent in some regions than others. Similarly, the message should be molded to reflect diverse cultural customs and practices of each region. We believed that burns can be prevented as people receive educational information and change their practices. Finally, we suggest that the federal government be involved, including the ministers of health of each state, in the prevention campaign. In this manner government resources and infrastructure can make the information available and attractive to all populations. Strategies can include the use of comics, cartoons, puppets; and having special editions of this flyers translated into all the different dialects that are spoken in the territory of the Mexican Republic. Additionally, safe barriers around cooking areas can be made with available supplies to prevent flame and scald burns of young children.

5 Limitations:

One limitation of this manuscript is that the population analyzed at our hospital are only the patients that are transported to our facility from Mexico to receive burn care and this cohort may just represent the tip of the iceberg of all childhood burn injuries in Mexico. Patients with more severe, life threatening injuries are typically sent to our pediatric burn facility. Patients with small burns in Mexico are not always sent to our pediatric burn facility if those patients can be properly cared for in Mexico. Also patients who died while being transported to our pediatric burn center were not included in this study. Readers should also be aware that our pediatric burn center may be receiving more burns from certain parts of Mexico than others because we may have a stronger working relationship with certain hospitals and certain states. Also, the Michou & Mau Foundation ultimately determines what patients are transported to our pediatric burn center. As a result, areas of Mexico that are better served by this charitable foundation are more likely to send patients to our hospital. However despite these qualifications, we believe that our analysis represents in a good extent the demographic and epidemiological characteristics of burn children in Mexico because of the diverse geographical origins, cultural backgrounds and financial resources that our patients possess. An additional limitation is that the relationship between flame burns and population density is very dependent upon Mexico City's population density. Mexico City, also known as Distrito Federal, has a much higher population density than other parts of Mexico. In our analysis, we found that if we were to drop Mexico City from our regression model, the relationship between flame burns and population density is no longer significant. Another limitation is that we did not have data on exact socioeconomic background of each of our patients. We had to use the socioeconomic characteristics of their state of origin as a proxy to approximate how poverty was correlated with type of burn injury. Likewise, we did not know the particular living situation of each family that came to us and had to use a state's population density as a proxy for how crowding may be correlated with type of burn injury. With regards to poverty, the authors of this study and Dissanaike and colleagues (2017) understand that there is no objective way to define poverty and other socioeconomic characteristics [15]. We believe the CONEVAL organization is a reputable Mexican governmental source that provides the best way for us to estimate poverty in each Mexican state [9]. Future research projects at our burn center and at many other burn centers can focus on collecting more socioeconomic information on patients so we can create a better framework for understanding the how socioeconomic factors correlate with burn injuries.

6 Conclusions:

The severity of burn injuries in young children in Mexico who were sent to our pediatric burn facility suggests the need for more effective burn prevention strategies. Campaigns to hinder burn injuries should be initially tailored to each region in Mexico taking into account each region's diverse socioeconomic variables and type of burn injuries. Further research is needed on the epidemiological and etiological nature of burns in this population.

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Highlights

- Identify socioeconomic factors associated with burn injury
- Flame burns associated with poverty percentage and population density.
- Increasing poverty led to decrease in odds of a flame burn
- Increasing poverty led to an increase in the odds of scald burns.

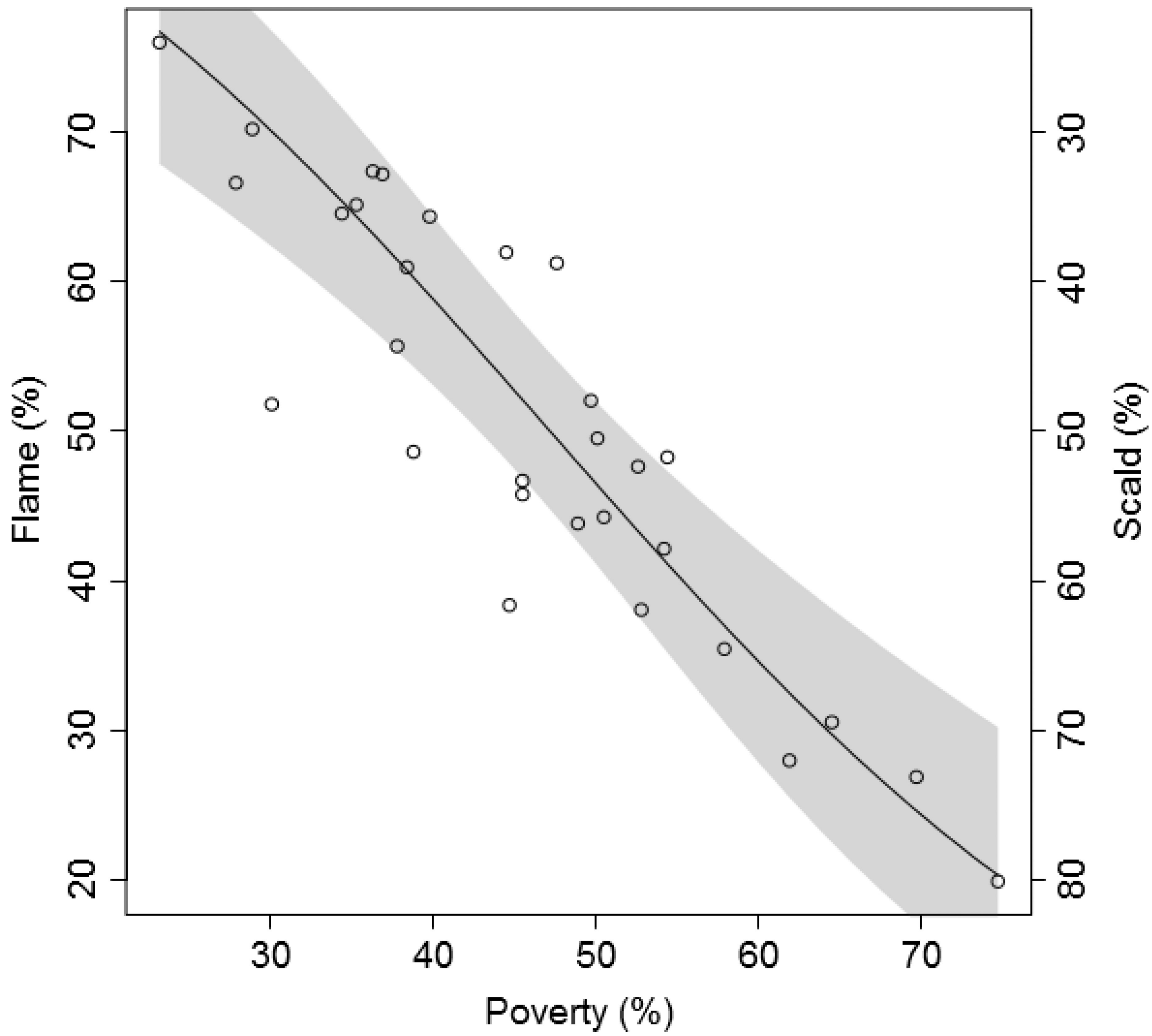


Figure 1:

Incidence of flame as opposed to scald burns with relation to poverty. The logistic regression line with shaded 95% confidence interval is overlaid on the model-adjusted scatterplot.

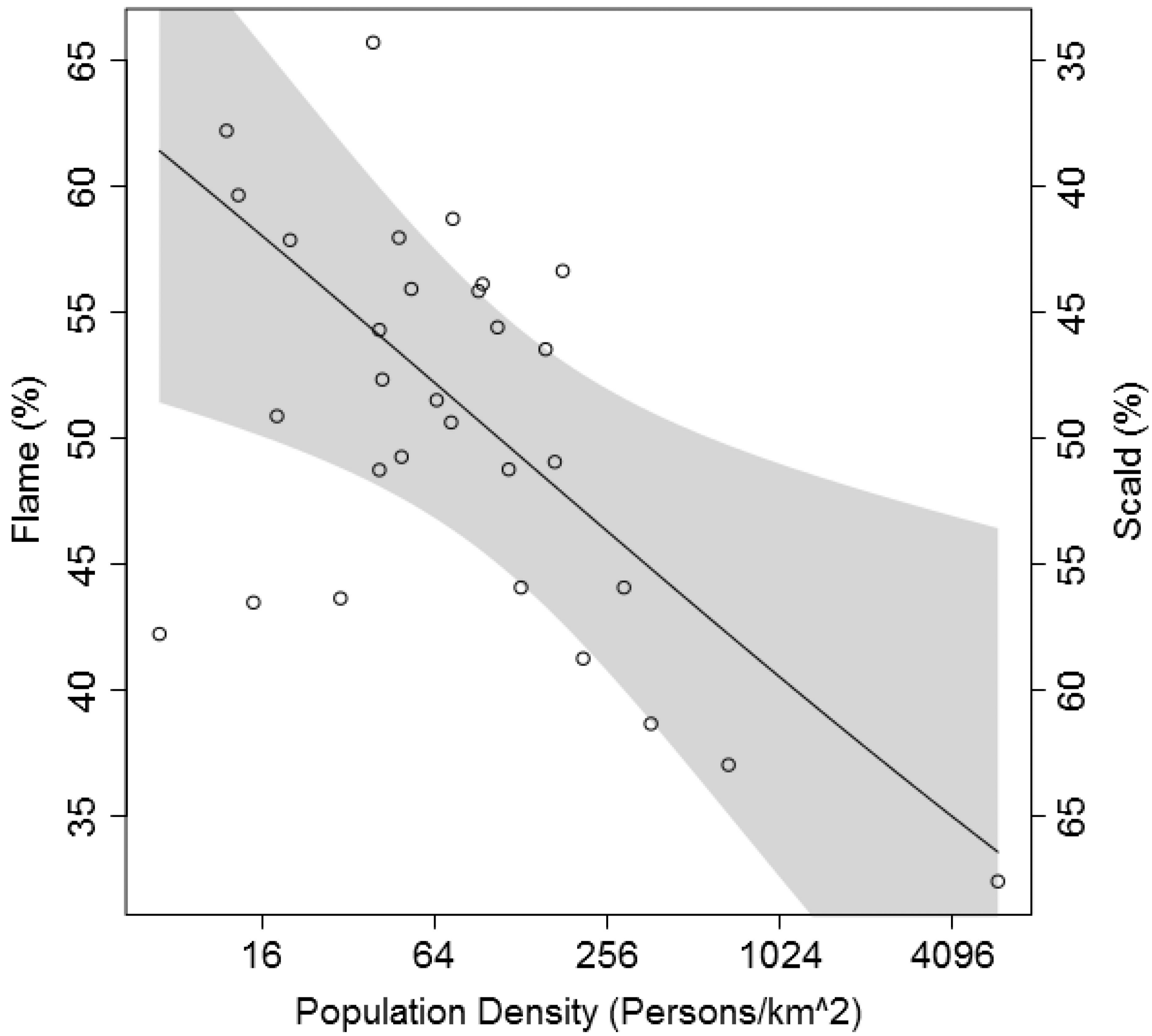
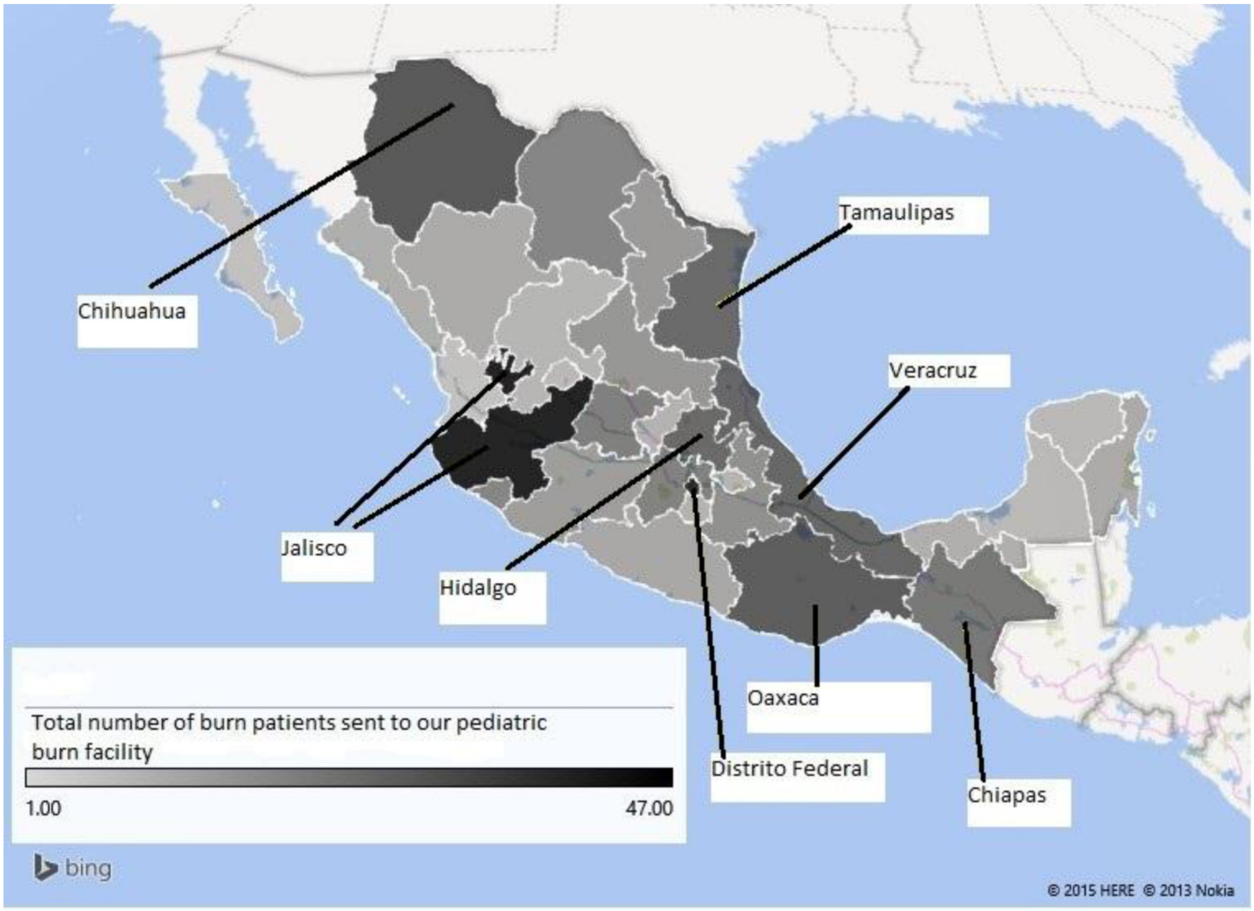
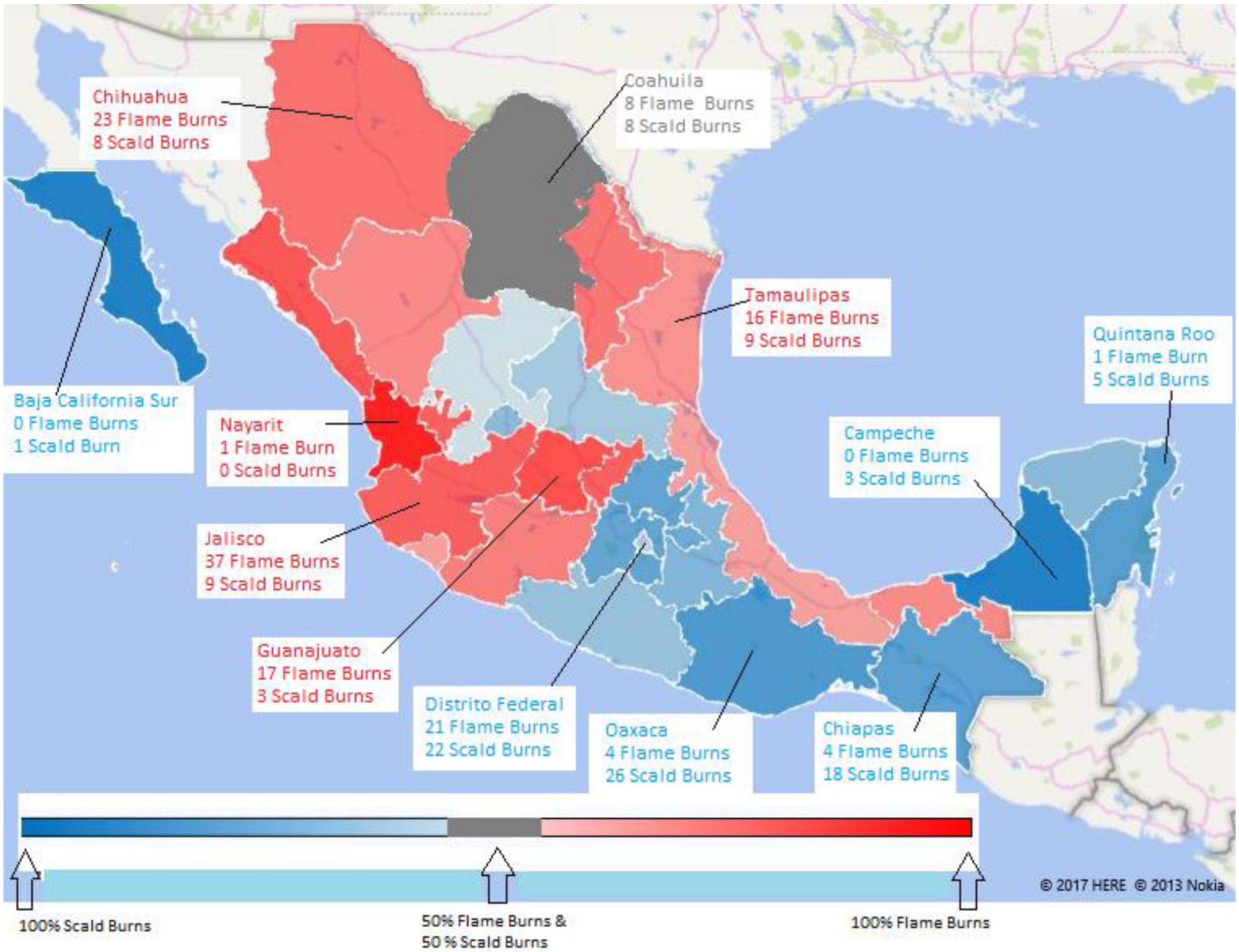


Figure 2:

Incidence of flame as opposed to scald burns with relation to population density. The logistic regression line with shaded 95% confidence interval is overlaid on the model-adjusted scatterplot.



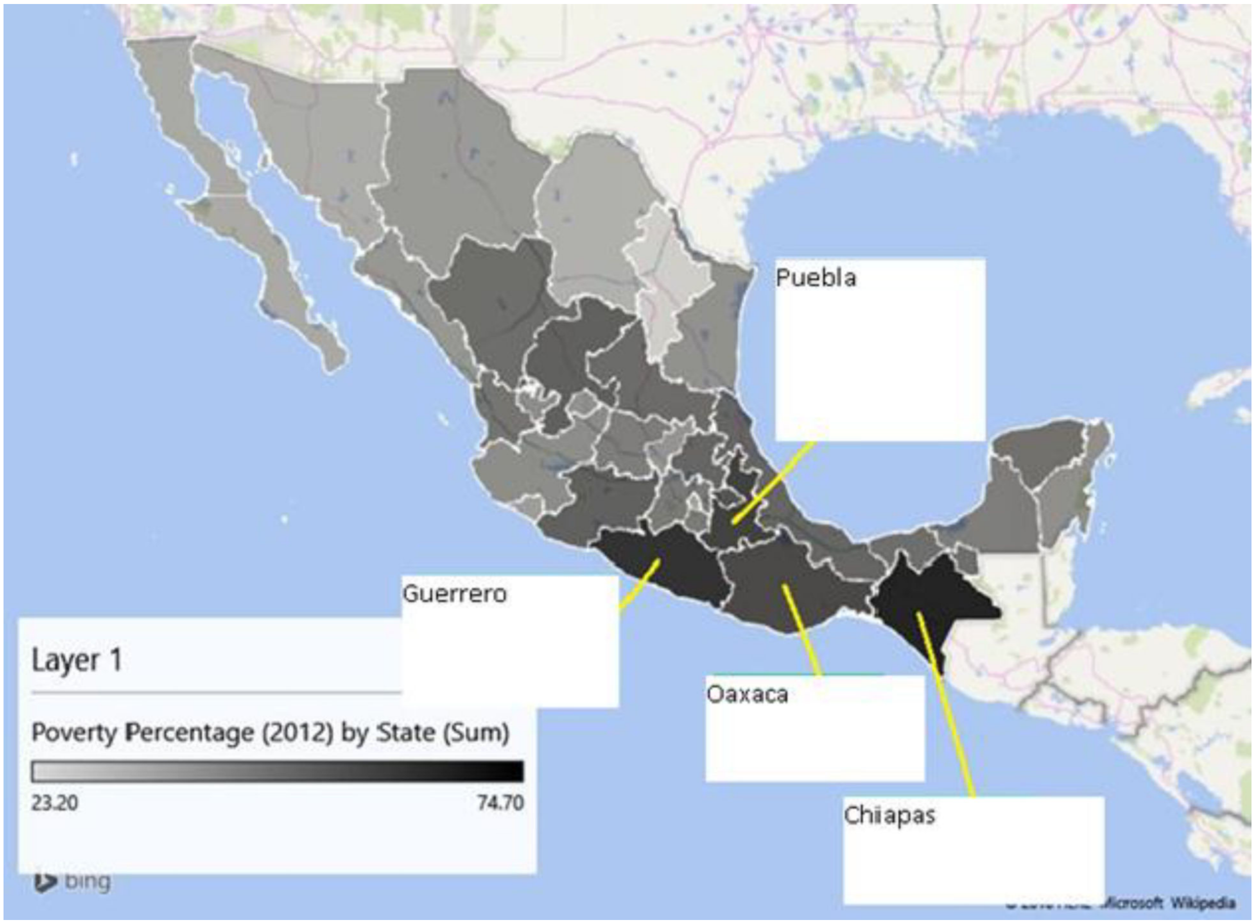
Map 1:
Distribution of patients sent to our pediatric burn facility by state.
Description: States shaded a darker color are states that we received more patients as compared to states shaded a lighter color.



Map 2:

Distribution of Flame and Scald Burns by State in Mexico

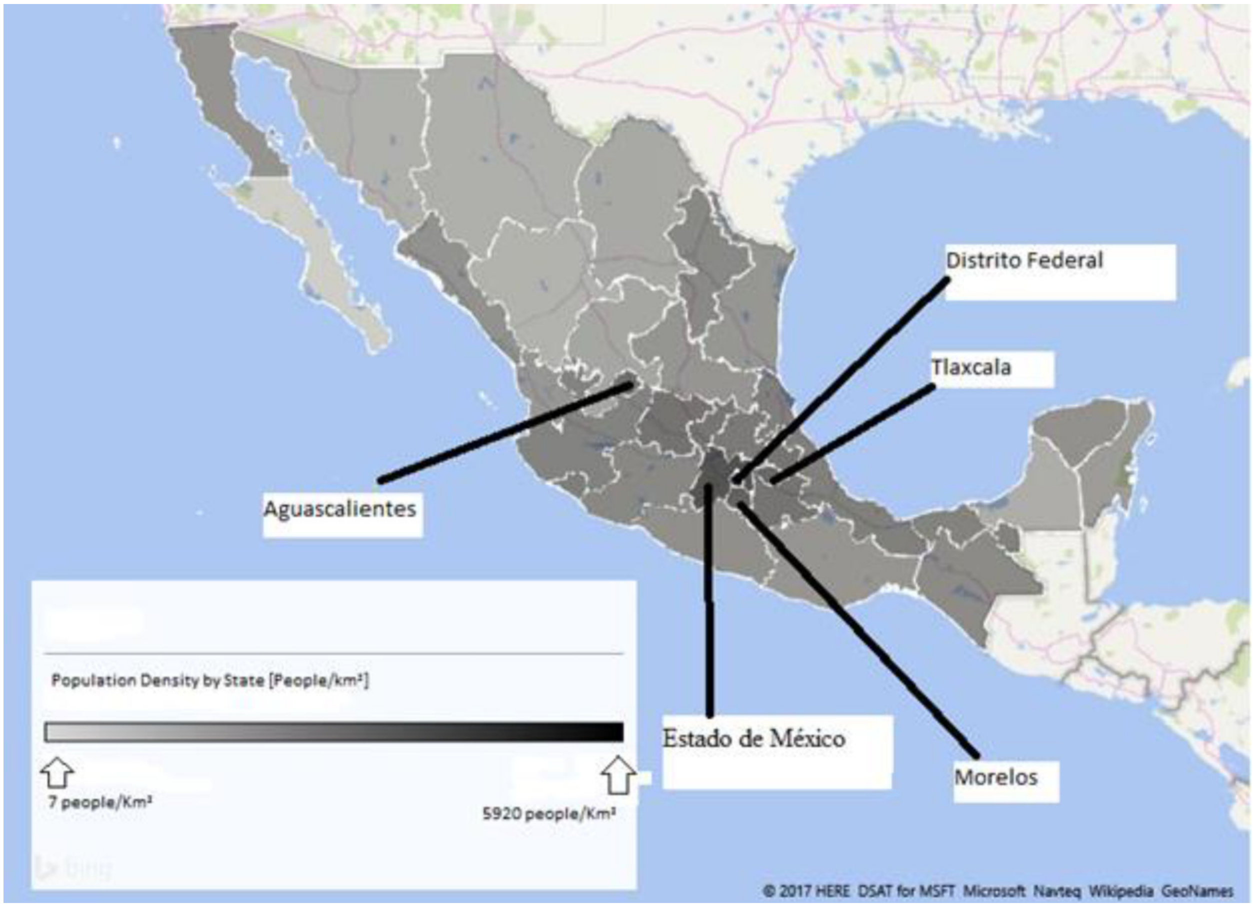
Description: Description: States with a greater incidence of flame burns within their borders are indicated by darker shades of red. States with a greater incidence of scald burns within their borders are indicated by darker shades of gray. States with an equal number of flame and scald burns are colored grey.



Map 3:

Poverty levels by state.

Description: States shaded a darker color had a higher percentage of its population living in poverty compared to states shaded a lighter color. [9]



Map 4:
Population density by state.
Description: States shaded a darker color had more people per square kilometer than states shaded a lighter color [10].

Table 1:

Total Number of Burn Patients, total scald patients, total burn patients, poverty levels, and population density for each state.

State	Number of patients sent to our hospital	Scald Burns	Flame Burns	Poverty Level[9]	Population Density (people/km^2)[10]
Aguascalientes	3	2	1	37.8	211
Baja California Norte	0	0	0	30.2	44
Baja California Sur	1	1	0	30.1	7
Campeche	3	3	0	44.7	14.9
Chiapas	22	18	4	74.7	65
Chihuahua	31	8	23	35.3	13.2
Coahuila	18	8	8	27.9	18
Colima	18	2	3	34.4	116
Distrito Federal	43	22	21	28.9	5920
Durango	7	2	4	50.1	12
Estado de México	19	15	4	45.5	679
Guanajuato	20	3	17	44.5	179
Guerrero	8	5	3	69.7	53
Hidalgo	26	20	5	52.8	128
Jalisco	47	9	37	39.8	94
Michoacán	11	3	7	54.4	74
Morelos	5	4	1	45.5	364
Nayarit	1	0	1	47.6	39
Nuevo León	12	3	8	23.2	73
Oaxaca	30	26	4	61.9	41
Puebla	15	9	4	64.5	168
Querétaro	5	1	4	36.9	156
Quintana Roo	7	5	1	38.8	30
San Luis Potosí	13	7	5	50.5	42
Sinaloa	6	1	5	36.3	48
Sonora	0	0	0	29.1	13
Tabasco	6	2	4	49.7	91
Tamaulipas	26	9	16	38.4	41
Tlaxcala	4	3	1	57.9	293
Veracruz	27	11	16	52.6	106
Yucatán	3	2	1	48.9	49
Zacatecas	4	2	2	54.2	20

Table 2:

Logistic regression coefficient summary for the incidence of flame burns as opposed to scald burns

	Estimate	Std. Error	z-value	Odds Ratio	CI95 Min	CI95 Max	p-value
Log2 (Population Density	−0.118	0.045	−2.63	0.89	0.81	0.97	0.0085
Percent Poverty	−0.050	0.009	−5.71	0.95	0.94	0.97	<0.0001